

## **REMARKS/ARGUMENTS**

### **Status of Claims**

Claims 1-9, 11-12, and 14-32 are pending in this application with claims 1, 19, and 25 being the only independent claims. Independent claims 1, 19, and 25 have been amended to include claim features recited in original claims 10 and 13, which have been cancelled without prejudice. The claims have been further amended to conform to U.S. practice without narrowing any claim element. New claims 31 and 32 have been added, which are supported by original claim 5 and paragraph [0041] of the published specification (*see*, U.S. Patent Application Publication 2006/0104327). No new matter has been added.

Reconsideration of the subject application in view of the above claim amendments and the following remarks is hereby respectfully requested.

### **Overview of the Office Action**

Claim 5 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite, but would be allowable if amended to remove the informality and rewritten in independent form.

Claims 1-4 and 6-30 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,535,537 to Kinoshita (“Kinoshita”).

### **Amendments Addressing Informalities**

Claim 5 has been amended to correct the alleged informality stated in the Office Action. The rejection of claim 5 is thus believed to have been overcome.

### **Summary of the Subject Matter Disclosed in the Specification**

The following descriptive details are based on the specification. They are provided only for the convenience of the Examiner as part of the discussion presented herein, and are not intended to argue limitations which are unclaimed.

The present specification discloses an optically pumped radiation-emitting semiconductor device (*see*, Fig. 1). The semiconductor device has a semiconductor body, which includes at least one pump radiation source (20) and a surface-emitting quantum well structure (11) monolithically integrated with the pump radiation source (20). The pump radiation source (20) is in the form of a pump laser with a resonator and generates pump radiation (2) for optically pumping the quantum well structure (11) arranged within the resonator.

A recess (10) is formed in the semiconductor body between the pump radiation source (20) and the quantum well structure (11). The recess (10) operates to introduce the pump radiation (2) in the quantum well structure (11).

### **Patentability of the Claimed Invention**

#### Independent Claims 1, 19, and 25

Independent claims 1, 19, and 25 each recite that “the pump radiation source is a pump laser comprising a resonator” and that “the quantum well structure is arranged within the resonator.” The above recited claim features are not taught by Kinoshita because (a) the vertical resonator 10 in Kinoshita is not part of the pump radiation source, as is the resonator recited in independent claims 1, 19, and 25 and (b) the reflective film 50 in Kinoshita is not a resonator as recited in independent claims 1, 19, and 25.

(A)

The Office Action suggests that the ring laser 30 in Kinoshita is a pump radiation source as recited in independent claims 1, 19, and 25 (*see*, page 3 of the Action). Without admitting or disputing the above interpretation and according to the teachings of Kinoshita, the ring laser 30 has a diffraction grating (holographic element) 11 that emits part of the light towards the medium (*see*, col. 4, ll. 21-23 of Kinoshita). Such emitted radiation is amplified by a gain region 40 and deflected back by a reflective film 50 (*see*, col. 5, ll. 10-13 and Fig. 1A of Kinoshita). In other

words, the radiation from the ring laser 30 is coupled out from the ring laser 30 (regarded as the pump radiation source according to the Action) and radiated into the vertical resonator 10.

According to the above teachings of Kinoshita, the vertical resonator 10 in Kinoshita is arranged outside the ring laser 30. Thus, the vertical resonator 10 of Kinoshita can not be considered to be part of the pump radiation source as is the resonator recited in independent claims 1, 19, and 25. Indeed, Kinoshita teaches that the “ring laser 30 has an annular mesa waveguide that surrounds the periphery of the circular cylindrical mesa 10 (*see*, col. 4, ll. 53-60; emphasis provided). Since the ring laser of Kinoshita surrounds the vertical resonator 10, the above cited portions of Kinoshita do not teach that “the pump radiation source is a pump laser comprising a resonator”, as now expressly recited in independent claims 1, 19, and 25.

(B)

The Office Action interprets the highly reflective film 50 in Kinoshita as the resonator recited in independent claims 1, 19, and 25 (*see*, page 4 of the Office Action). Applicants disagree.

As is submitted above, the reflective film 50 in Kinoshita operates to reflect the radiation already coupled out from the ring laser 30 by the diffraction grating 11. More specifically, the ring laser 30 and the reflective film 50 are arranged concentrically. Consequently, the reflective film 50 in Kinoshita does not operate as a resonator of the ring laser 30. In fact, the radiation propagating in the ring laser 30 in a path that is concentric to the reflective film 50 and thus does not impinge onto the reflective film 50. Only the radiation that is coupled out of the ring laser 30 is reflected by the reflective film 50. Accordingly, the reflective film 50 in Kinoshita cannot operate as a resonator of the ring laser 30.

Accordingly, the reflective film 50 of Kinoshita can not be considered to disclose, teach, or suggest “the pump radiation source is a pump laser comprising a resonator”, and “the quantum

well structure is arranged within the resonator of the pump radiation source”, as now recited in independent claims 1, 19, and 25.

In view of the above, Kinoshita’s quantum well structure, resonator, and pump radiation source are arranged differently from those recited in independent claim 1, 19, or 25. Accordingly, independent claims 1, 19, and 25 each patentably distinguish over Kinoshita. Withdrawal of the rejections is hereby respectfully requested.

Dependent Claims 2-9, 11-12, 14-18, 20-24, and 26-32

Applicants thank the Examiner for indicate the allowability of claim 5 but wish to defer rewriting claim 5 in independent form until the remaining rejections are resolved.

Claims 2-9, 11-12, 14-18, 20-24, and 26-32 depend, directly or indirectly, from allowable independent claim 1, 19, or 25 and are each allowable therewith. In addition, all dependent claims each include features that serve to still further distinguish the respective claimed invention over the cited art.

**Conclusion**

Based on all of the above, it is respectfully submitted that the present application is now in proper condition for allowance. Prompt and favorable action to this effect and early passing of this application to issue are respectfully solicited.

Should the Examiner have any comments, questions, suggestions or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

It is believed that no fees or charges are required at this time in connection with the present application. However, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,  
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